

The present listing of claims replaces all prior versions and listings of claims in the subject patent application.

Listing of Claims:

Claim 1 (currently amended): A method for increasing absorption of light radiation incident on a surface of a crystalline silicon photo responsive device which comprises the step of forming a grating having a period of less than about 1.1 μm on the surface of said photo responsive device upon which the light is incident such that higher grating orders are generated within said photo responsive device and a greater amount of the incident light entering said photo responsive device propagates more closely to the surface upon which the light is incident than is achieved by refraction, ~~thereby increasing light absorption by said photo responsive device close to the surface upon which light is incident.~~

Claim 2 (original): The method as described in claim 1, wherein said photo responsive device is selected from the group consisting of solar cells and photo detectors.

Claim 3 (canceled): The method as described in claim 2, wherein said solar cell comprises silicon.

Claim 4 (original): The method as described in claim 1 further comprising the step of forming a grating on the surface of said photo responsive device opposite to the surface upon which light is incident.

Claim 5 (original): The method as described in claim 1, wherein said photo responsive device comprises silicon having a thickness of $< 100 \mu\text{m}$.

Claim 6 (original): The method as described in claim 1, wherein said step of forming a grating comprises reactive ion etching.

Claim 7 (previously amended): The method as described in claim 6, further comprising the step of selective KOH etching to remove reactive ion etching induced surface damage.

Claim 8 (original): The method as described in claim 1, wherein said step of forming a grating comprises wet chemical etching.

Claim 9 (previously amended): The method as described in claim 1, wherein the grating comprises rectangular projections.

Claim 10 (previously amended): The method as described in claim 1, wherein the grating comprises triangular projections.

Claim 11 (original): The method as described in claim 1, wherein the grating comprises a blazed grating.

Claim 12 (previously amended): The method as described in claim 2, wherein the grating is chosen to have optimal performance within the solar spectrum.

Claim 13 (previously amended): The method as described in claim 1, further comprising the step of anti-reflection coating the surface of the grating upon which light is incident.

Claim 14 (original): The method as described in claim 2, further comprising the step of forming a junction in the solar cell using ion implantation.

Claim 15 (currently amended): A method for producing a crystalline silicon solar cell having increased absorption of light radiation incident on a surface thereof which comprises the steps of: (a) forming a grating having a period of less than about 1.1 μm on the surface of said solar cell upon which the light is incident such that higher grating orders are generated within said solar cell and a greater amount of the incident light entering said solar cell propagates more closely to the surface upon which the light is incident than is achieved by refraction; (b) removing surface contamination; (c) forming an n-type junction using gas source doping; and (d) forming n- and p-electrical contacts.

Claim 16 (original): The method as described in claim 15, wherein said step of forming a grating comprises reactive ion etching.

Claim 17 (previously amended): The method as described in claim 16, further comprising the step of removing reactive ion etching-induced surface damage using wet chemical etching.

Claim 18 (previously amended): The method as described in claim 17, wherein said step of wet chemical etching comprises exposing the surface to KOH and nitric acid solutions.

Claim 19 (original): The method as described in claim 15, wherein said step of forming a grating comprises wet chemical etching.

Claim 20 (currently amended): A method for producing a crystalline silicon solar cell having increased absorption of light radiation incident on a surface thereof which comprises the steps of: (a) forming a grating having a period less than about 1.1 μm on the surface of said solar cell upon which the light is incident such that higher grating orders are generated within said solar cell and a greater amount of the incident light entering said solar cell propagates more closely to the surface upon which the light is incident than is achieved by refraction; (b) cleaning the surface to remove surface contamination; (c) forming an n-type junction by ion implantation; (d) annealing the solar cell formed thereby; and (e) forming n- and p-electrical contacts.

Claim 21 (original): The method as described in claim 20, wherein said step of forming a grating comprises reactive ion etching.

Claim 22 (original): The method as described in claim 20, wherein said step of forming an n-type junction comprises ion implantation using $^{31}\text{P}^+$.

Claim 23 (original): The method as described in claim 20, wherein said step of annealing the solar cell comprises heating the solar cell in an oxygen atmosphere.

Claim 24 (original): The method as described in claim 20, wherein said step of forming a grating comprises wet chemical etching.